

Amendments to the Claims:

All claims have been amended herein. All of the pending claims are presented below. This listing of claims will replace all prior versions and listings of claims in the application. Please enter these claims as amended.

Listing of Claims:

1. (currently amended) An apparatus for applying adhesive material to one or more underside surfaces of at least one semiconductor component, comprising:
an adhesive reservoir configured to provide an exposed surface of adhesive material to only a defined portion of each of one or more underside surfaces of at least one semiconductor component positioned thereover, said the adhesive reservoir comprising at least one pool chamber defined by at least one upward facing opening, said the adhesive reservoir shaped such that the exposed surface of adhesive material is supplied to a precise location above said the at least one upward facing opening, said the adhesive material having a surface tension; and
at least one mechanism associated with said the adhesive reservoir, said the at least one mechanism configured to level said the exposed surface of adhesive material at said the precise location above said the at least one upward facing opening and maintain said the exposed surface of adhesive material at a substantially constant height, said the at least one mechanism including at least a pump configured to supply said the adhesive material to said the adhesive reservoir and a control system to control said the supply of said the adhesive material to said the adhesive reservoir to control extrusion of said the adhesive material to a selectable height.
2. (currently amended) The apparatus of claim 1, wherein said the at least one upward facing opening, in combination with said the surface tension of said the adhesive material, is configured to provide an exposed surface comprising a meniscus.

3. (currently amended) The apparatus of claim 1, wherein said-the at least one mechanism is configured to manipulate the surface tension of the adhesive material to flatten the exposed surface of said-the adhesive material.

4. (Currently amended) The apparatus of claim 1, wherein said-the at least one mechanism is configured to manipulate the-a difference in pressure within said-the adhesive material and ambient air to be equal to twice the surface tension of said-the adhesive material divided by a radius of curvature of the adhesive material as the adhesive material is extruded through the at least one mechanism.

5. (Currently amended) The apparatus of claim 1, wherein said-the at least one mechanism is configured to use the surface tension of the adhesive material to control surface area and thickness of the adhesive material available for application to said-the at least one semiconductor component.

6. (Currently amended) The apparatus of claim 1, wherein said-the at least one mechanism further comprises at least one of a coating stencil, a wiper, a vacuum, and a height detection mechanism.

7. (Currently amended) The apparatus of claim 1, wherein said-the at least one mechanism further comprises a coating stencil including:
a generally flat and generally horizontal top surface; and
a plurality of apertures aligned to wet said-the defined portion of said-the at least one semiconductor component with said-the adhesive material, said-the plurality of apertures sized and configured to control extrusion of said-the adhesive material through said-the coating stencil to define an area of the exposed surface of said-the adhesive material.

8. (Currently amended) The apparatus of claim 7, wherein said-the coating stencil is disposed over said-the at least one upward facing opening of said-the at least one pool chamber, such that the only access from within said-the at least one pool chamber through said-the at least one upward facing opening to above the adhesive reservoir is through said-the plurality of apertures of said-the coating stencil.

9. (Currently amended) The apparatus of claim 7, wherein the plurality of apertures of said-the coating stencil is substantially rectangular in shape.

10. (Currently amended) The apparatus of claim 7, wherein the plurality of apertures of said-the coating stencil is substantially square in shape.

11. (Currently amended) The apparatus of claim 7, wherein the plurality of apertures of said-the coating stencil is positioned substantially parallel to each other and is spaced so as to have a centerline pitch between each aperture of said-the plurality of apertures of .020-inches inch (.051 cm).

12. (Currently amended) The apparatus of claim 11, wherein the plurality of apertures of said-the coating stencil numbers 23 in quantity.

13. (Currently amended) The apparatus of claim 7, wherein the plurality of apertures of said-the coating stencil is .260-inches inch (.660 cm) in length and is .010-inches inch (.025 cm) in width.

14. (Currently amended) The apparatus of claim 7, wherein the plurality of apertures of said-the coating stencil is sized and configured as a result of considering adhesive material viscosity.

15. (Currently amended) The apparatus of claim 14, wherein the plurality of apertures of said-the coating stencil is sized and configured to suit an adhesive material viscosity ranging from approximately 1000 to 500,000 centipoise.
16. (Currently amended) The apparatus of claim 14, wherein the plurality of apertures of said-the coating stencil is sized and configured to optimally accommodate an adhesive material viscosity of approximately 62,000 centipoise.
17. (Currently amended) The apparatus of claim 14, wherein the plurality of apertures of said-the coating stencil is sized and configured to optimally accommodate an adhesive material viscosity of approximately 62,000 centipoise at a temperature of approximately 77° F (25° C).
18. (Currently amended) The apparatus of claim 7, wherein the plurality of apertures of said-the coating stencil is arranged generally parallel to each other and is spaced so as to have a centerline pitch between each aperture of said-the plurality of apertures of .020-inches inch (.051 cm).
19. (Currently amended) The apparatus of claim 18, wherein the plurality of apertures of said-the coating stencil numbers 23 in quantity.
20. (Currently amended) The apparatus of claim 18, wherein the plurality of apertures of said-the coating stencil is .260-inches inch (.660 cm) in length and is .010-inches inch (.025 cm) in width.
21. (Currently amended) The apparatus of claim 7, further comprising a vacuum on a bottom side of said-the coating stencil.

22. (Currently amended) The apparatus of claim 1, further comprising at least one second mechanism configured to bring the said-defined portion of the at least one semiconductor component in contact with said-the exposed surface of adhesive material.
23. (Currently amended) The apparatus of claim 1, wherein said-the adhesive reservoir further comprises an adhesive circulation mechanism configured to circulate said-the adhesive material and maintain uniformity of said-the adhesive material.
24. (Currently amended) The apparatus of claim 1, wherein said-the at least one mechanism is attached to said-the adhesive reservoir.
25. (Currently amended) The apparatus of claim 1, wherein said-the at least one semiconductor component comprises at least one lead finger on a lead frame.
26. (Currently amended) An apparatus for applying viscous material to one or more underside surfaces of at least one semiconductor component, comprising:
a reservoir for providing an exposed surface of viscous material to only one or more underside surfaces of at least a portion of at least one semiconductor component positioned thereover, said-the reservoir comprising at least one pool chamber in fluid communication with a viscous inflow chamber, said-the at least one pool chamber defined by at least one upward facing opening, said-the reservoir shaped such that the exposed surface of viscous material is supplied to a precise location above said-the at least one upward facing opening, said-the viscous material having a surface tension;
at least one first mechanism configured to provide said-the viscous material to a desired selectable height above said-the at least one upward facing opening, said-the at least one first mechanism comprising at least a pump for supplying said-the viscous material to said-the reservoir and a control system for controlling said-the supply of the viscous material to said-the reservoir; and

at least one second mechanism associated with said-the reservoir, said-the at least one second mechanism configured to level said-the exposed surface of viscous material above said-the at least one upward facing opening, to maintain said-the exposed surface of viscous material at a substantially constant height and to increase the effective exposed surface of viscous material.

27. (Currently amended) The apparatus of claim 26, wherein said-the exposed surface comprises a meniscus.

28. (Currently amended) The apparatus of claim 26, wherein said-the at least one second mechanism is configured to manipulate said-the surface tension of the viscous material to flatten out the exposed surface of said-the viscous material.

29. (Currently amended) The apparatus of claim 26, wherein said-the at least one second mechanism is configured to manipulate the difference in pressure within said-the viscous material and ambient air to be equal to twice the surface tension of the said-viscous material divided by a radius of curvature of the viscous material as the viscous material is extruded through the at least one second mechanism.

30. (Currently amended) The apparatus of claim 26, wherein said-the at least one second mechanism is configured to use the surface tension of the viscous material to control surface area and thickness of the viscous material available for application to said-the at least one semiconductor component.

31. (Currently amended) The apparatus of claim 26, wherein said-the at least one second mechanism further comprises at least one of a coating stencil, a wiper, a vacuum, and a height detection mechanism.

32. (Currently amended) The apparatus of claim 26, wherein said-the at least one second mechanism comprises at least one coating stencil including:
a generally planar horizontal top surface; and
a plurality of openings positioned to wet said-the at least a portion of said-the at least one semiconductor component with said-the viscous material, said-the plurality of openings sized and configured to control extrusion of said-the viscous material through said-the at least one coating stencil to further increase the exposed surface of said-the viscous material.

33. (Currently amended) The apparatus of claim 32, wherein said-the at least one coating stencil is disposed over said-the at least one upward facing opening of said-the at least one pool chamber, such that the only access from within said-the at least one pool chamber through said-the at least one upward facing opening to above the reservoir is through said-the plurality of openings of said-the at least one coating stencil.

34. (Currently amended) The apparatus of claim 32, wherein said-the plurality of openings of said-the at least one coating stencil is configured to apply said-the viscous material to only a selected portion of said-the at least one semiconductor component.

35. (Currently amended) The apparatus of claim 32, wherein the plurality of openings of said-the at least one coating stencil is generally rectangular in shape.

36. (Currently amended) The apparatus of claim 32, wherein the plurality of openings of said-the at least one coating stencil is generally square in shape.

37. (Currently amended) The apparatus of claim 32, wherein the plurality of openings of said-the at least one coating stencil is positioned generally parallel to each other and is spaced so as to have a centerline pitch between each opening of said-the plurality of openings of .020 inches inch (.051 cm).

38. (Currently amended) The apparatus of claim 37, wherein the plurality of openings of said-the at least one coating stencil numbers 23 in quantity.

39. (Currently amended) The apparatus of claim 32, wherein the plurality of openings of said-the at least one coating stencil is .260-inches inch (.660 cm) in length and is .010-inches inch (.025 cm) in width.

40. (Currently amended) The apparatus of claim 32, wherein the plurality of openings of said-the at least one coating stencil is sized and configured as a result of considering viscous material viscosity.

41. (Currently amended) The apparatus of claim 40, wherein the plurality of openings of said-the at least one coating stencil is sized and configured to manage a viscous material viscosity ranging from approximately 1000 to 500,000 centipoise.

42. (Currently amended) The apparatus of claim 40, wherein the plurality of openings of said-the at least one coating stencil is sized and configured to optimally accommodate a viscous material viscosity of approximately 62,000 centipoise.

43. (Currently amended) The apparatus of claim 40, wherein the plurality of openings of said-the at least one coating stencil is sized and configured to optimally accommodate a viscous material viscosity of approximately 62,000 centipoise at a temperature of approximately 77° F (25° C).

44. (Currently amended) The apparatus of claim 32, wherein the plurality of openings of said-the at least one coating stencil is arranged generally parallel to each other and is spaced so as to have a centerline pitch between each opening of said-the plurality of openings of .020-inches inch (.051 cm).

45. (Currently amended) The apparatus of claim 44, wherein the plurality of openings of said-the at least one coating stencil numbers 23 in quantity.

46. (Currently amended) The apparatus of claim 32, wherein the plurality of openings of said-the at least one coating stencil is .260-inches inch (.660 cm) in length and is .010-inches inch (.025 cm) in width.

47. (Currently amended) The apparatus of claim 32, wherein said-the at least one first mechanism comprises a vacuum on a bottom side of said-the at least one coating stencil.

48. (Currently amended) The apparatus of claim 26, further comprising at least one third mechanism configured to bring said-the at least one semiconductor component in contact with said-the exposed surface of viscous material.

49. (Currently amended) The apparatus of claim 26, wherein said-the reservoir further comprises a circulation mechanism configured to circulate said-the viscous material and maintain uniformity of said-the viscous material.

50. (Currently amended) The apparatus of claim 26, wherein said-the at least one second mechanism is attached to said-the reservoir.

51. (Currently amended) The apparatus of claim 26, wherein said-the at least one semiconductor component comprises at least one lead finger of a lead frame.